

REMARKS

Claims 1-6, 8, 10-19, 21-35, 37-47, 50-52 and 56-69 are pending in the above-captioned patent application after this amendment. Claims 17, 18, 33-42, 50-53 and 62-69 have been rejected. Claims 1-6, 8-19, 21-32, 43-47, 53 and 56-61 have been objected to.

The Applicants respectfully disagree with the rejection of claims 17, 18, 33-42, 50-53 and 62-69. However, the Applicants have amended claims 17, 18, 31-33, 41, 42, 50, 62 and 66, and canceled claims 9 and 53 without prejudice with this amendment for the purpose of expediting the patent application process in a manner consistent with the goals of the Patent Office (65 Fed. Reg. 54603), and/or to clarify what the Applicants regard as the present invention. Additionally, the Applicants have amended claims 1, 3-5, 8, 19, 21, 22, 24, 26, 28, 37-39, 56, 65 and 69 with this amendment to correct certain informalities, some of which were noted in the objections to the claims, and not to respond to any specified claim rejections. Please note that claim 8 had been previously amended as amended herein through an Examiner's Amendment, however the Applicants mistakenly included the original version of the language in claim 8 when they filed the Request for Continued Examination.

Support for the amendments to claims 17, 18, 31-33, 41, 42, 50, 62 and 66 can be found throughout the originally filed specification. In particular, support for the amendments to claims 17, 18, 31-33, 41, 42, 50, 62 and 66 can be found in the specification at page 18, line 15 through page 19, line 2, at page 23, line 22 through page 24, line 16, in Figures 3, 10A and 10B, and in the originally filed claims.

No new matter is believed to have been added by this amendment. Reconsideration of the pending application is respectfully requested.

Objection to the Claims

Claims 3, 19, 21-32, 33, 37, 39, 43-47, 53 and 56-69 have been objected to by the Patent Office for certain informalities. More particularly, claim 3 has been objected to because a "first reflector" is claimed, but a second reflector is not featured in any of claims 1-18; claims 19-32 have been objected to because a first path, a first beam and a first redirector are claimed, but a second path, a second beam and a second redirector are not featured in any of the claims; claim 33 has been objected to because a first system and a

first beam (source) are claimed, but a second system and a second beam (source) are not claimed; claim 37 has been objected to as it claims a first redirector, but a second redirector has not been claimed; claim 39 has been objected to as it claims a first reflector, but a second reflector has not been claimed; claims 43-47 have been objected to because a first path is claimed, but not a second path; claims 56-61 have been objected to because a first path is claimed, but not a second path; claims 62-69 have been objected to because there is a lack of antecedent basis for “the device” in claims 62 and 66, and because claims 62 and 66 claim a first system and a first beam (source), but a second system and a second beam (source) have not been claimed in any of the respective sets of claims; and claims 65 and 69 have been further objected to as they claim a first reflector, but a second reflector is not claimed. Additionally, claim 53 is objected to under CFR 1.75(c) as being of improper dependent form for failing to further limit the subject matter of the previous claim, as claim 50 already includes the limitations provided in claim 53.

In response to the above claim objections, the Applicants have amended claims 3, 19, 33, 37, 39, 62, 65, 66 and 69 to remove the word “first” in front of the various elements where there is no corresponding second element within the corresponding set of claims. Further, the Applicants have also amended claims 62 and 66 to replace “the device” with “the substrate”, so as to overcome the objection of the Examiner. Accordingly, the Applicants respectfully submit that the objections to claims 3, 19-32, 33, 37, 39, 62, 65, 66 and 69 have been overcome. Additionally, the Applicants have canceled claim 53 without prejudice with this amendment. Accordingly, the Applicants respectfully submit that the objection to claim 53 is moot.

Regarding the objection to claims 43-47, the Applicants respectfully point out that claim 43 includes not only a “first path” as noted by the Examiner, but claim 43 also includes a “redirected path”. The fact that the Applicants chose to refer to a subsequent path as a “redirected path” as opposed to a “second path” is of no import. Accordingly, the Applicants respectfully submit that the objection to claims 43-47 is improper and the Applicants respectfully request that the objection to claims 43-47 be withdrawn.

Regarding the objection to claims 56-61, the Applicants respectfully point out that in addition to claim 56 including a “first path”, claim 57, which depends directly from claim 56, includes a “second path.” Accordingly, the Applicants respectfully submit that the

objection to claims 56-61 is improper and the Applicants respectfully request that the objection to claims 56-61 be withdrawn.

Allowable Subject Matter

The Examiner provides that claims 1-32, 43-47 and 56-61 are objected to, but would be allowable if rewritten to correct the objections mentioned above.

The Applicants contend that independent claim 1 and dependent claims 2, 4-6, 8 and 10-18, which depend directly or indirectly from claim 1, have not been specifically objected to by the Examiner. Claims 4, 5 and 8 have been amended with the amendment herein to correct certain informalities that were not objected to by the Examiner. Further, as discussed in greater detail below, claims 17 and 18 have been amended herein to overcome the stated rejection of the Examiner. Accordingly, the Applicants respectfully submit that claims 1, 2, 4-6, 8 and 10-18 should be allowed. Additionally, claim 3, as provided above, has been amended herein to overcome the objections cited by the Examiner. Therefore, the Applicants respectfully submit that claim 3 is in a condition for allowance.

Additionally, the Applicants have amended claim 19, as provided above, to overcome the objections cited by the Examiner. Additionally, the Applicants have amended claims 21, 22, 24, 26 and 28 herein to correct certain informalities that were not objected to by the Examiner. Further, as discussed in greater detail below, claims 31 and 32 have been amended herein to overcome the stated rejection of the Examiner. Accordingly, the Applicants respectfully submit that claims 19 and 21-32 are in a condition for allowance.

Further, the Applicants contend that the basis for the objection to claims 43-47, as provided above, is improper. Accordingly, the Applicants respectfully submit that claims 43-47 should be allowed.

Still further, the Applicants contend that the basis for the objection to claims 56-61, as detailed in the previous section, is improper. Additionally, the Applicants have amended claim 56 with the amendment herein to correct certain informalities that were not objected to by the Examiner. Accordingly, the Applicants respectfully submit that claims 56-61 are in a condition for allowance.

Rejections Under 35 U.S.C. § 102(b)

Claims 17, 18, 31-42, 50-53 and 62-69 have been rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,552,888 issued to Sogard et al. ("Sogard et al."). The Applicants respectfully submit that the rejection of claims 33, 50, 62 and 66, as amended, is unsupported by the art and should be withdrawn. Further, the Applicants respectfully submit that the rejection of claims 17, 18, 31, 32, 41 and 42, as amended, is unsupported by the art and should be withdrawn. Additionally, claim 53 has been canceled without prejudice with this amendment. Accordingly, the Applicants respectfully submit that the rejection of claim 53 under 35 U.S.C. § 102(b) is moot.

More particularly, the Examiner contends that Sogard et al. discloses a lithographic exposure apparatus having the basic components of a stage 105, a device and stage mover 525, a measurement system and method of measurement, wherein the sheath 500 in Figure 5 shields the interferometer beam path 185 near the stage follower motor 525, thus inhibiting environmental conditions. Further, the Examiner contends that Sogard et al. discloses additional features as claimed in the present application. Still further, the Examiner contends that the exposure apparatus of Sogard et al. will produce the device and wafer claimed in claims 17, 18, 31, 32, 41 and 42.

The Applicants provide that Sogard et al. is directed to an interferometer used for measuring the position of an XY stage that includes a laser sheath that encloses a substantial part of the measurement beam's path to provide a controlled environment which reduces environmental influences on the measured distance. A typical XY stage 105, which is usable with the invention disclosed in Sogard et al., retains a wafer 100 that is mounted in a chuck, and the XY stage 105 has a bed 110 movable by operation of a controllable positioning device 115 along the X direction and a bed 120 movable by operation of a controllable positioning device 125 along the Y direction.

As shown, for example, in Figure 5, the laser sheath 500 surrounding the measurement beam 185 is made up of a fixed sheath portion 505; a movable sheath portion 510, which travels with the stage bed 110 of an XY stage 105 as the wafer 100 is moved along the X direction, wherein the movable sheath portion 510 is positioned in the X direction by a stage follower motor 525; a sliding seal 515, which allows movement of the movable sheath portion 510 in the X direction without loss of vacuum; and a window

520 through which the measurement beam 185 passes to reach the mirror 170. Alternatively, as shown in Figures 3 and 4, the sheath 300, 400 can be in contact with the stage mirror 170, which is mounted on the stage bed 110. While Figure 5 and certain other embodiments disclosed in Sogard et al. provide for an enclosed vacuum environment within the sheath 500, Sogard et al. also provide that other environments, such as an enclosed gas atmosphere, can be used within the sheath. Each embodiment disclosed in Sogard et al. uses the sheath to provide an enclosed environment for the measurement beam. (Sogard et al. Abstract, column 1, lines 14-20, column 2, lines 56-62, column 5, lines 10-55, column 11, line 61 through column 12, line 4, and Figures 1, 3-5, and 13).

However, Sogard et al. does not disclose a measurement system for measuring the position of a stage, wherein the measurement system includes a beam source that directs a beam at the stage and an open-ended shield that inhibits environmental conditions from influencing the beam. As noted above, each embodiment disclosed by Sogard et al. provided for an enclosed vacuum or gas or other well-controlled environment within the sheath 500 in order to reduce environmental influences on the beam. Further, Sogard et al. does not specifically teach positioning the shield near at least a portion of the stage mover assembly. Sogard et al. discloses the sheath 500 positioned near at least a portion of the stage follower motor 525, but Sogard et al. does not teach positioning the sheath 500 near at least a portion of the controllable positioning devices 115, 125, which move the beds 110, 120 of the XY stage 105 in the X and Y directions, respectively.

In distinction to Sogard et al., amended claim 33 recites “(a) combination ... comprising: a stage that retains the device; a stage mover assembly that moves the stage; and a measurement system for measuring the position of the stage, the measurement system comprising a system including a beam source that directs a beam at the stage and an open-ended shield positioned near at least a portion of the stage mover assembly and adjacent to a path of the beam so that the shield inhibits environmental conditions from influencing the beam.”

Because Sogard et al. does not teach or suggest all of the elements of amended claim 33, the § 102(b) rejection is unsupported by the art and should be withdrawn. Further, because claims 34-40 depend either directly or indirectly from amended claim 33,

the rejection of claims 34-40 is also unsupported by the art and should be withdrawn. Still further, claims 41 and 42 have been amended herein to claim a process for manufacturing a device and a wafer, respectively, which recites active steps within the process that are not taught or suggested by Sogard et al. Accordingly, the rejection of claims 41 and 42, which depend indirectly from amended claim 33, is also unsupported by the art and should be withdrawn.

Additionally, in distinction to Sogard et al., claim 50 recites “(a) method for positioning a device ... comprising the steps of: providing a stage that retains the device; moving the stage with a stage mover assembly; and measuring the position of the stage with a measurement system, the measurement system comprising a beam source that directs a beam at the stage and an open-ended shield positioned near at least a portion of the stage mover assembly and adjacent to a path of the beam so that the shield inhibits environmental conditions from influencing the beam.”

Because Sogard et al. does not teach or suggest all of the elements of claim 50, the § 102(b) rejection is unsupported by the art and should be withdrawn. Further, because claims 51 and 52 depend directly from amended claim 50, the rejection of claims 51 and 52 is also unsupported by the art and should be withdrawn.

Further, in distinction to Sogard et al., amended claim 62 recites “(a) method for exposing a substrate, comprising the steps of: retaining the substrate on a stage; moving the stage by a stage mover assembly; measuring the position of the stage by a measurement system, the measurement system comprising a system including a beam source that directs a beam at the stage and an open-ended shield positioned near at least a position of the stage mover assembly and adjacent to a path of the beam so that the shield inhibits environmental conditions from influencing the beam; and irradiating an energy beam to the substrate.”

Because Sogard et al. does not teach or suggest all of the elements of amended claim 62, the § 102(b) rejection is unsupported by the art and should be withdrawn. Further, because claims 63-65 depend directly from amended claim 62, the rejection of claims 63-65 is also unsupported by the art and should be withdrawn.

Additionally, in distinction to Sogard et al., amended claim 66 recites “(a) method of making an exposure apparatus ... comprising the steps of: providing a stage that

retains the substrate; providing a stage mover assembly that moves the stage; and providing a measurement system for measuring the position of the stage, the measurement system comprising a system including a beam source that directs a beam at the stage and an open-ended shield positioned near at least a portion of the stage mover assembly and adjacent to a path of the beam so that the shield inhibits environmental conditions from influencing the beam.”

Because Sogard et al. does not teach or suggest all of the elements of amended claim 66, the § 102(b) rejection is unsupported by the art and should be withdrawn. Further, because claims 67-69 depend directly from amended claim 66, the rejection of claims 67-69 is also unsupported by the art and should be withdrawn.

Regarding claims 17, 18, 31, 32, 41 and 42, as noted above, the Examiner contends that the exposure apparatus of Sogard et al. will produce the device and wafer claimed in these claims. In response, the Applicants have amended claims 17, 18, 31, 32, 41 and 42 herein to recite a process for manufacturing a device or wafer including the active steps of providing a substrate and transferring a image onto the substrate with the exposure apparatus.

More particularly, in distinction to Sogard et al., amended claim 17 recites “(a) process for manufacturing a device including the steps of providing a substrate and transferring an image onto the substrate with the exposure apparatus according to claim 16.” Additionally, in distinction to Sogard et al., amended claim 18 recites “(a) process for manufacturing a wafer including the steps of providing a substrate and transferring an image onto the substrate with the exposure apparatus of claim 16.” Further, in distinction to Sogard et al., amended claim 31 recites “(a) process for manufacturing a device including the steps of providing a substrate and transferring an image onto the substrate with the exposure apparatus according to claim 30.” Additionally, in distinction to Sogard et al., amended claim 32 recites “(a) process for manufacturing a wafer including the steps of providing a substrate and transferring an image onto the substrate with the exposure apparatus of claim 30.” Still further, in distinction to Sogard et al., amended claim 41 recites “(a) process for manufacturing a device including the steps of providing a substrate and transferring an image onto the substrate with the exposure apparatus according to claim 40.” Additionally, in distinction to Sogard et al.,

amended claim 42 recites "(a) process for manufacturing a wafer including the steps of providing a substrate and transferring an image onto the substrate with the exposure apparatus of claim 40."

Because Sogard et al. does not teach or suggest all of the elements of amended claims 17, 18, 31, 32, 41 and 42, the § 102(b) rejection of these claims is unsupported by the art and should be withdrawn.

Conclusion

In conclusion, the Applicants respectfully assert that claims 1-6, 8, 10-19, 21-35, 37-47, 50-52 and 56-69 are patentable for the reasons set forth above, and that the application is now in a condition for allowance. Accordingly, an early notice of allowance is respectfully requested. The Examiner is requested to call the undersigned at 858-456-1951 for any reason that would advance the instant application to issue.

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Respectfully submitted,



STEVEN G. ROEDER
Attorney for Applicants
Registration No. 37,227

THE LAW OFFICE OF STEVEN G. ROEDER
5560 Chelsea Avenue
La Jolla, California 92037
Telephone: (858) 456-1951